



## Aquatic Invertebrate Community Monitoring at Homestead National Monument of America

### Importance: *The canary in the coalmine and the bugs in the creek*

Scientists commonly monitor aquatic invertebrates, the insect larvae and nymphs, worms, isopods and other invertebrates living in creeks, to assess water quality. Many benthic invertebrates reside in the stream substrate for a year or more, exposed to water quality conditions throughout that time. Some species tolerate poor water quality and some species require pristine conditions. Therefore, aquatic invertebrate monitoring provides a sound tool to recognize deterioration of water quality in a stream, just as the canary indicates deterioration of air quality in a coalmine.



*Cub Creek channel*

### Long Term Monitoring: *Using indices to determine conditions*<sup>1</sup>

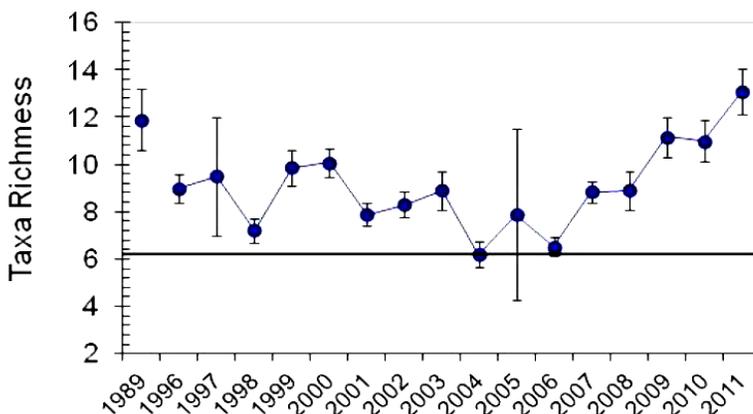
Heartland Inventory and Monitoring Network scientists used a Hester-Dendy sampler to collect invertebrate samples at two monitoring sites on Cub Creek at Homestead National Monument of America. They also deployed a data logger to record temperature, dissolved oxygen, specific conductance, pH and turbidity for the 24 hours prior to sampling. After identifying and counting invertebrates in the samples, scientists employed a suite of statistical indices that evaluate invertebrate community composition, using the data. They compared the invertebrate indices across sampling years, looking for status and trends in indicators of stream health.

### Status and Trends: *Improvements in a somewhat impaired stream*

While samples from Cub Creek within the monument showed no significant trends of change in stream integrity, they did show great variability. Stream integrity has not diminished since the beginning of sampling in 1989. Although taxa richness

has increased since 2006, evaluation of all calculated indices suggests that the aquatic invertebrate communities within Cub Creek are probably slightly impaired. Scientists also found:

1. Known human disturbance originates upstream and outside of the park, limiting the parks options for mitigating or remediating the stream integrity problems.
2. Continued partnership with US Department of Agriculture agencies to promote conservation in the watershed should continue to benefit water quality in Cub Creek.



*Taxa richness is the number of different species or other taxa represented in a group or a location. This control chart shows the means (dots) and standard errors (vertical bars) for taxa richness at Cub Creek over the sampling years. The horizontal line represents the control limit (set to the Type 1 error) that triggers a significant concern about the trend in taxa richness decline.*

Heartland Inventory and Monitoring Network of the National Park Service. Visit

[www.nps.gov/im/units/htln/index.htm](http://www.nps.gov/im/units/htln/index.htm)

... protecting the habitat of our heritage



<sup>1</sup> Bowles, D.E. and M.K. Clark. 2012. *Aquatic invertebrate monitoring at Homestead National Monument of America, Nebraska 1996-2011 trend report. Natural Resource Technical Report NPS/HTLN/NRTR—2012/612. National Park Service, Fort Collins, Colorado.*